2-1969

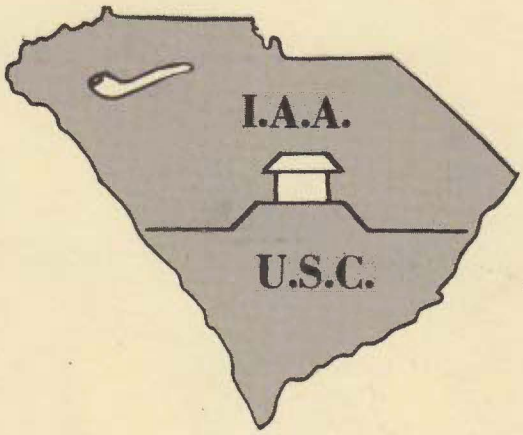
Notebook - February 1969

South Carolina Institute of Archaeology and Anthropology--University of South Carolina

THE INSTITUTE OF ARCHEOLOGY AND ANTHROPOLOGY

NOTEBOOK

THE UNIVERSITY OF SOUTH CAROLINA • COLUMBIA



A monthly report of news and activities of mutual interest to the individuals and organizations within the framework of the Institute of Archeology and Anthropology at the University of South Carolina and for the information of friends and associates of the Institute.

ROBERT L. STEPHENSON, EDITOR

VOLUME I FEBRUARY 1969 NUMBER 2

SCIAA-NOTE
1969

THE INSTITUTE OF ARCHEOLOGY AND ANTHROPOLOGY

The University of South Carolina
Columbia, South Carolina 29208

Ph. 777-8170

STAFF

Dr. Robert L. Stephenson, Director and State Archeologist

Mr. John D. Combes, Assistant Director

Mrs. Betty O. Williams, Secretary

Mr. Paul Brockington, Student Laboratory Assistant

Miss Karen Lindsay, Student Laboratory Assistant

Miss Pamela Morgan, Student Laboratory Assistant

Mr. George Chitty, Student Assistant, Illustrator

Mr. Donald R. Sutherland, Collaborator (Department of Anthropology and Sociology)

EDITOR'S PAGE

The matter of putting the first issue of THE NOTEBOOK to bed, getting it printed, addresses prepared, and copies mailed took more time than was anticipated but 600 copies of the January 1969 issue did get out. Fast on its heels comes the February issue since most of the mechanics of publication have now been worked out. There hasn't been time for much response from the first issue but what has come in seems to be favorable so we will proceed as planned.

The Archeological Society of South Carolina is now a reality and there have been two rousing good meetings so far. More will be said elsewhere in this issue about the Society but let us say now that anyone with a serious interest in any kind of amateur archeology is welcome to join.

We now have firm commitments that Stanley South will join our staff on April 1 and Thomas Hemmings will join us on September 1. Stan comes to us from the Department of Archives and History in Raleigh, North Carolina and will devote his major efforts with us to the archeology of historic sites. Tom is finishing his doctoral work at the University of Arizona in Tucson and will concentrate his major efforts with us on the archeology of prehistoric sites, especially those of the Early Man period. We congratulate ourselves on getting both these fine people to join us for archeological research in South Carolina.

The work of the Institute is proceeding at a rapid pace and threatens to overwhelm all of us. There is so much to do in all parts of the state and so few of us to do it, but we are trying to keep up. It will be a tremendous help when we can get moved into permanent quarters which we anticipate will take place next month.

This month we have an information article about the anthropology program at South Carolina from Donald Sutherland, Instructor in the Department of Anthropology at the University of South Carolina. We also have an article of major significance on design and use of a resistivity measuring device for archeology by John Combes of our Institute staff.

Again we ask any of you who have short manuscripts of a paragraph to six or eight pages of appropriate material pertinent to South Carolina to send them to us. We will be glad to consider them for publication in THE NOTEBOOK. Send material to:

Dr. Robert L. Stephenson
The Institute of Archeology and Anthropology
University of South Carolina
Columbia, South Carolina 29208

ANTHROPOLOGY AT THE UNIVERSITY OF SOUTH CAROLINA

by Donald R. Sutherland

Anthropology at the University of South Carolina is more a matter of potential than it is of fact. Several courses appear in the University Catalogue, but only a few of them are actually being taught because of a shortage of personnel. In fact, I am presently the only member of the teaching staff in Anthropology at the University of South Carolina.

Assuming that a full program were available, a student coming here with an interest in Anthropology would first have to meet the admission requirements of the College of Arts and Sciences. He then would have to meet the basic requirements of this college for the Bachelor of Arts degree and the requirements of the Department of Anthropology and Sociology for a major in Anthropology.

Any student seeking a Bachelor of Arts degree in the College of Arts and Sciences must fulfill the following basic course requirements:

1. English - 101, 102, 103, 104; 4 semesters for 12 credit hours.
2. History - 101, 102, 103, 104; 4 semesters for 12 credit hours.
3. Foreign Language - be able to pass a third year level course (301 and 302). Depending upon his preparation, a student may begin at either the 101, 201, or 301 levels. This means his language requirement could range from 2 semesters for 6 credit hours to 6 semesters for 18 credit hours.
4. Mathematics or Philosophy - Math 101 and 102, or Math 121 and 122, or Philosophy 101 and 102 may be chosen for 2 semesters giving 6 credit hours. The nature of the math varies according to the choice made.
5. Natural Science - these are courses with laboratory work, thus carry 4 credit hours each (credit hours refer to the number of hours a week a class meets). Three semesters are required for a total of 12 credit hours. Courses may be chosen from Biology, Chemistry, Geology, Physics and Astronomy, and Geography. A few Psychology courses may also be used. Two courses must come from one science and one from a different science.
6. Political Science 201 - one semester for 3 credit hours.
7. Physical Education - 2 semesters for 2 credit hours.

The courses offered in Anthropology are as follows:

*101. Introductory Anthropology - Surveys major fields of Anthropology.

102, Physical Anthropology - Deal with such matters as human heredity, growth
*251. and development, the relationships between man biologically and culturally, primates in general, human evolution, race, and the future

evolution of man.

*255. Social Anthropology - Concerns the nature of culture, how it varies, and how it has been studied.

357. Culture and Personality - Concerns the relationship between culture and the individual personality.

360. Primitive Technology and Techniques - An analysis of the material inventions and discoveries of people without writing and their effect on the societies using them.

361. Museum Techniques - Concerns the methods of cataloging, exhibiting, photographing, analyzing, interpreting, preparing, etc. scientific specimens.

362, 363. Archeological Field Research - Training in archeological field methods, including site location, excavation, and analysis. South Carolina archeological sites are visited.

365. Old World Archeology - Europe, Asia, Africa and the Pacific.

*366. New World Archeology - North and South America. These courses deal with the evidence for cultural development in the areas concerned from the earliest remains through the appearance of civilizations.

498. Senior Seminar - An overview of anthropology and its related fields. This synthesizes work done in other courses.

*501, 502, 503, *504. Ethnology of North America, Asia, Africa, and the South Pacific respectively. These courses compare the cultures found within each area.

*550. Introduction to the Study of Linguistics. (Given in the Department of English.)

*591, *592, *593, *595. Literature and Research in Physical Anthropology, Social Anthropology, Ethnology, and Archeology respectively. These courses involve individual research and study in the areas concerned. There are no classes and a student works directly under the supervision of one faculty member who guides his work.

*Indicates courses actually being taught.

The requirements that must be met for a major in Anthropology are as follows:

1. Anthropology 101 - must be taken before all other Anthropology courses.
2. Sociology 101
3. Anthropology 550
4. Anthropology 102 or 251

5. Anthropology 255 or 357
6. One course from Anthropology 360, 361, 363, 364, 365 or 366
7. One course from Anthropology 501, 502, 503 or 504
8. One course from Anthropology 591, 592, 593 or 595
9. Three elective courses which may be chosen from among the Anthropology courses not used in fulfillment of a requirement. This brings the total number of credit hours required for the Anthropology major to 33.
10. Cognates - In addition to the courses in the major, three or four courses for a total of 12 credit hours must be taken in fields related to the major. Typically, advanced courses in Sociology, Psychology, History, Geography, Political Science, Economics, International Relations, and some in Geology and Biology may be used for this requirement.

To graduate from the College of Arts and Sciences with a Bachelor of Arts degree, 120 semester hours of credit in academic subjects is required. Credit hours for Physical Education and special activities, like Band, do not count. The various requirements outlined so far account for between 96 and 108 semester hours.

This can be summarized as follows:

Basic degree requirements - 51-63 hours	
(Depends upon time spent on language requirement.)	
Requirements in Anthropology	-33 hours
Cognates	-12 hours
Total	96 - 108 hours

What this means is that outside of assorted requirements you are free to choose for your own interest between 12 and 24 semester hours worth of courses. It allows totally free choice of between 3 and 8 courses depending upon how long is spent on the language requirement and upon whether 3 or 4 credit hour courses are chosen.

At present, the limited teaching staff in Anthropology makes it virtually impossible to major in it unless courses are taken during the summers at another institution. However, we do feel that a student can gain enough background in Anthropology here to go elsewhere to do graduate work. Also, it is possible to earn a combined major in both Anthropology and Sociology. In this case the requirements are similar except that some of the Anthropology courses are replaced by courses in Sociology. This gives adequate preparation for graduate work in either field.

Hopefully, new staff will be added within the next two years and a fully developed program will get underway. It is also our hope to completely revise the course offerings and requirements to make them consistent with the most recent trends in preparation for the discipline. Because of the opportunity to start from the bottom, we feel that an especially outstanding program can be constructed at this University and we hope to attract the bright young

minds that can make it possible.

Beyond this, the Anthropology teaching program is especially fortunate in being able to integrate its activities with the Institute of Archeology and Anthropology, a research unit. Students will have a chance to participate in active research in the future, as the Institute plans growth of its own, and will have an opportunity to write for its publications.

In conclusion, despite the present status of Anthropology at the University of South Carolina, its future has the potential to be notably brilliant. Now would be a good time for a high school student who is interested in anthropology to consider taking such a major here. He has ample basic courses offered now for his first two years and by that time there should be a fully developed program for his professional degree.

ARCHEOLOGICAL SOCIETY OF SOUTH CAROLINA

Last fall several of us got together informally to discuss the organization of an amateur archeological society in South Carolina. There had been such a society in past years but it disbanded sometime ago and interest was developing to start an amateur group again. A dozen of us met on October 25 and again on November 15 and decided to go ahead with the project.

On January 17 we had the first organizational meeting at the Columbia Science Museum. We read a tentative constitution and by-laws, suggested some names for the society and discussed the plans and procedure for such a society. James Michie of Columbia was elected temporary Chairman and James Turner of Charleston was elected temporary Secretary. There were 72 people present from 22 towns throughout the state. It was decided that the society would meet regularly on the third Friday of each month at the Columbia Science Museum at 1519 Senate Street, Columbia, at 8:30 P.M.

The second meeting was held as scheduled on the 21st of February and there were 63 in attendance. The constitution and by-laws were read and adopted, and officers were elected to serve during 1969. These officers are: President, James L. Michie of Columbia; Vice-President, James A. Turner, Jr. of Isle of Palms; Secretary, Lucia Harrison of Columbia; Treasurer, M. Gay Suber of Columbia; Editor, Maurice James Green of Lexington; Directors, Dr. Robert L. Stephenson of Columbia, T. E. "Herb" Hester of Columbia; Tony Harper of Greenville; Frank F. Hill of Columbia; Roy J. Lyons of Aiken; and Dr. Chapman J. Milling of Columbia.

The name "Archeological Society of South Carolina" was adopted and by unanimous approval it was decided that all those who have been at any one of the meetings up to this time could be Charter Members. Membership dues were set at $5.00 per year or $6.00 for a family membership. Anticipated activities of the Society are laboratory workshops, field workshops, organized study of the literature of archeology, exhibits of specimen materials, and

other activities as appropriate. These will be in addition to the regular monthly meetings at which there will be guest speakers who will discuss various aspects of archeology, exhibits of specimens, slide shows of various archeological projects and the regular business of the Society. We also plan a newsletter and, hopefully, other publications later on.

The Society off to a good start and should be a major stimulus to its stated purposes. These are: (1) "To unite all those who are interested in the archeology of South Carolina as a means of promoting the study and preservation of the archeological remains of the state and to encourage and foster a constructive public attitude toward those remains. (2) To encourage and participate in the scientific investigation, study, interpretation, and display of archeological remains in South Carolina and in the publication and distribution of the results thereof. (3) To promote the conservation and display of archeological sites and materials that are or may be threatened by destructive agencies. (4) To discourage the careless, unrecorded digging of archeological remains and to exercise all possible efforts to prevent vandalizing, trespassing, looting, and other wanton destruction of archeological sites and materials and the manufacture and sale of fraudulent antiquities. (Article II of the constitution).

Anyone who is interested in archeology and the collecting of prehistoric and historic artifacts and who has a sincere interest in understanding the scientific and cultural meaning of the materials he collects is welcome to membership in the Society. We are not interested in simply adding people to our roster but we are interested in adding all of those people who have an interest in the objectives of the Society. If you are one of these please come to the next meeting that will be held in the Columbia Science Museum, 1519 Senate Street, Columbia, at 8:30 P.M. on Friday, March 21. If you can't come to the meeting write any one of the officers or Directors at his address or at the Society address which is: Institute of Archeology and Anthropology, University of South Carolina, Columbia, South Carolina, 29208.

STUDENT ASSISTANTS ON THE STAFF

George (Rick) Chitty joined the part-time student assistant staff as illustrator on January 13. Rick is in the art school and has demonstrated an interest and competence in archeological illustration. This brings our student assistant staff to four. Paul Brockington and Karen Lindsay joined the staff on October 21 and Pamela Morgan on November 18. All three are anthropology students and are working in the laboratory. We are fortunate to have these capable and dedicated students with us.

THE CHARLES TOWNE PROJECT

The Tricentennial Commission asked the Institute to propose further archeological work in 1969 at Charles Towne. On January 8 the Commission approved our proposal for a six month's program. This consists of ten weeks of field excavation to begin in April 1969 and sixteen weeks of laboratory analyses and report writing. The work will be directed by Stanley South with a crew of ten men. We are taking applications for work on this project now. Anyone who is willing to work hard on careful scientific excavation and can be available through April, May, and June is urged to apply. No previous training is necessary but he must be over 16 years of age.

We anticipate that after ten weeks of field work and time for laboratory analyses of the findings we should know a great deal about this 1670-1680 English settlement. Although the total quantity of specimens may be small the details of features in the ground and the specimens we do find will be unusually informative.

COOPERATION WITH WOFFORD COLLEGE

On January 27, John Combes and I went to Spartanburg to meet with Dr. John Harrington of the Geology Department at Wofford College and several of his students. During the month of January, between semesters, Dr. Harrington had nine of his students working on three archeological projects in the Spartanburg area. Project "1" was a survey of the Steatite Quarry Sites in the area. Project "2" was a survey of rock shelter sites in the area. Project "3" was a test excavation of one rock shelter. The students did a good job on all three projects especially since they had had no formal training in archeology. They had had good training in geology by a fine teacher who has interest in and knowledge of archeology.

We visited the shelter that was being tested and three of the steatite quarry sites. The students are now writing up their reports and we hope to hear more from them on these projects. We concluded the day with a field lecture on archeology. These projects will provide the Institute with a little more knowledge of sites in that area and I hope we were able to impart some training and encouragement to the Wofford students. Our thanks to Dr. Harrington for creating the opportunity.

PRICE'S POST OFFICE

The Spartanburg County Historical Association has acquired title to an early 19th century building near the town of Moore and plans to do a restoration of it. The house is called "Price's Post Office" although it is thought that the actual post office was a few yards away and that this house was the residence of Thomas Price.

At the request of Mr. Edward S. Tennant we visited this site on January 27 on the way back from Wofford College. We met with Mr. Tennant, Mrs. Gignilliat and Mr. Bain, of the Association, and examined this large, two and a half story brick structure. Archeological research is needed to identify the time period and features of the structure and to recover artifacts of the period. The work required should not be very extensive but is necessary to enable the Association to do the restoration that they wish to do.

A tentative proposal was made to the Association and has been tentatively accepted by Mr. Tennant. We will make this formal in the near future and plan to do the work as we can get to it between other, larger projects.

SOUTH CAROLINA INDIAN MUSEUM

We visited this very good small museum at Santee last month and visited with Mr. Robert Lafaye who has been working hard to develop the museum. The collections are well displayed and mainly relate to South Carolina, especially the Santee area. We also visited the Fort Watson Indian mound only a short distance away. The mound is protected by the Department of Parks, Recreation, and Tourism and sometime should be properly excavated and interpreted.

LAND'S FORD CANAL

The Department of Parks, Recreation, and Tourism is planning the development of the old canal along the Catawba River between Chester and Lancaster Counties north of Great Falls. Prior to any refurbishing of the canal archeological research will be required. To this end John Combes and I visited the site on February 11 with Janson Cox and Bill Lampkin of the P.R.T. staff and were joined there by several others representing the local area and the Duke Power Company.

We examined the canal line, the locks, the lockkeeper's house ruin, and the old mill ruin. Archeological work on the canal itself should be a minor project and an only slightly larger project should adequately take care of the lockkeeper's house and the old mill. Discussions are still being held with the P.R.T. people in regard to getting this project under way.

NINETY SIX AND STAR FORT

Through the extensive efforts of Mr. Bruce Ezell, the Greenwood County Historical Society, the Star Fort Historical Commission and others in Greenwood County over the past several years the development of Old Ninety Six and the Start Fort are moving forward. The State Department of Parks, Recreation, and Tourism is working closely with the Greenwood County people in this development. Dr. Edwards began some archeological investigations of the area several years ago and the time has come now to develop a full archeological plan for the site.

John Combes, Stanley South, and I, together with Janson Cox and Archie Hardy of the Department of Parks, Recreation, and Tourism,drove to Ninety Six to visit the site and appraise the archeological requirements. We had Mr. South come down from North Carolina for the purpose due to the significance of the site and since he will no doubt be intimately involved with the site after he joins the Institute staff.

We met with Mr. Ezell and several others there and drove out to Old Ninety Six to spend all morning and into the afternoon examining the site. This is really more than one site or complex of sites. It includes Gouedy's Trading Post of the early 1750's, the Old Town of Ninety Six, the pre-Revolutionary War fortifications, and the Star Fort of 1780-81. Altogether it covers a good many acres and a span 35 years or so. The trading post and the town were major points on the transportation routes of the time and formed a sort of transportation "hub" for this and surrounding colonies. The Star Fort was a crucial "hub" of British military strength in the southern colonies during the Revolutionary War. Its defense against the Americans was of major importance. Oddly enough, though, the whole town and fortifications died shortly after the war and the present town of Ninety Six is several miles away.

The inspection team examined the area rather carefully for the purpose of developing a reasonable plan for the most expedicious archeological work that would be needed in order to properly understand the post, the town, and the fort. Such a plan would need to be within the framework of reasonable financial possibility. Extensive archeological work will be required to gain an understanding of this complex of sites. A minimum program of only basic exploratory excavation and testing would require a year or more. A realistic program of at least three or four years should be

developed.

Following our trip to the site we returned to the Greenwood Country Club for a fine, late lunch with the Star Fort Historical Commission and the County Delegation. We discussed various methods of approaching the work and the Institute was asked to develop a proposal for archeological work at the site.

COLLETON COUNTY SITES

On February 14, John Combes and I,together with Mr. Barney Slawson of the State Department of Archives and History and Mr. Janson Cox of the Department of Parks, Recreation, and Tourism, spent the day in Colleton County looking at three historic sites. We met with Mr. Lloyd Duncan of the Walterboro Chamber of Commerce, several representatives of the West Virginia Pulp and Paper Company, and several others in Walterboro. Our first stop was at the old site of Parkers Ferry on the right bank of the Edisto River. Here a strange sort of zig-zag earthworks paralleling the river extends for two or three hundred yards at a height of 8 to 12 feet. Old tree growth on the earthwork suggests that it is probably in the range of 150 to 200 years old. We were not able to determine what it was but it was suggested that it may have been an earthwork to defend the river while the British occupied the coast during the Revolutionary War. Minor testing here may reveal the nature of this earthwork.

Our second stop was at the "Temple of Sports" near Green Pond. This was a brick-columned structure built by Colonel Bernard Elliott before the Revolution. It was brought to our attention by Mr. L. W. Alford of Walterboro. Minor testing around the bases of the columns is all the archeology that would be called for.

Finally we visited another earthworks near Green Pond. Here several conical and linear mounds of some 15 feet height are adjacent to an earthen platform of about 5 feet in height. The platform is some 100 feet in diameter and on it are several above-surface graves, some with dates as early as 1813. Again we were not able to identify the nature of the earthworks but they seem to be of historic origin and may also relate to a defensive position during the Revolutionary War. Some modestly extensive archeological tests here may provide answers to the nature of this earthwork.

RESISTIVITY REVISITED: NEW INSTRUMENTATION FOR USE AS A TOOL IN ARCHEOLOGICAL RECONNAISSANCE

by John D. Combes

The use of soil resistance measurement devices has long been known to archeologists but used by only a few. The reasons are perhaps twofold, the lack of an exhaustive study dealing with the usefulness and limitations of this technique and the lack of a good, easy-to-use instrument. This brief paper will deal with an instrument designed for archeological reconnaissance and tested at the Institute of Archeology and Anthropology at the University of South Carolina.

General Description of Unit and Operation

The unit consists of a lightweight metal box containing the electrical components (9 x 8 x 13 inches), two lead wires, and two stainless steel probes.(See figure 1.) For the investigation of a rather large area, where you are merely surveying for archeological remains, it has been found convenient to take readings in a straight line across a suspected area at ten-foot intervals. This is done by inserting the probes ten feet apart, taking care that they are driven into the ground the same depth each time and consistently placed at ten-foot intervals. (It is very important that the distance apart and the distance of penetration be the same for any given survey. If it is decided to use five-foot intervals with a penetration of two feet during a survey you must not change in the middle of the investigation to ten-foot intervals with three-foot penetration.) Once the probes are inserted and the unit turned on, the control knob is turned until the needle is at the zero position. The control knob reading is then recorded on a graph on which one axis is resistance and the other is distance. After this reading is taken the first probe is removed and set out ten feet further. Two men can operate the unit easily, one reading the instrument and the other moving the probes one at a time in a "leap-frog" manner along the line.

It must be remembered that the use of the instrument in this manner is a "low level" use and is designed only to rapidly detect, by chance, an archeological feature in a large area. A look at the graph at the completion of the line will give you a resistance profile of the field and will show you immediately if a resistance anomaly is present along the line. In most cases if there is a subsurface archeological feature such as a burial, post mold, well, house floor, etc., it will show up as a decrease or increase in resistivity. (See figure 2.) This will pinpoint a location that should then be investigated archeologically. The number and placement of these lines is up to the judgment of the archeologist and would be based on the situation at hand.

The other use of the instrument, or the "high level" use of the unit is after the site has been located. It has been found convenient to grid out the entire area of interest in ten-foot units and take measurements at one-foot intervals in both directions across the ten-foot units. The intervals here

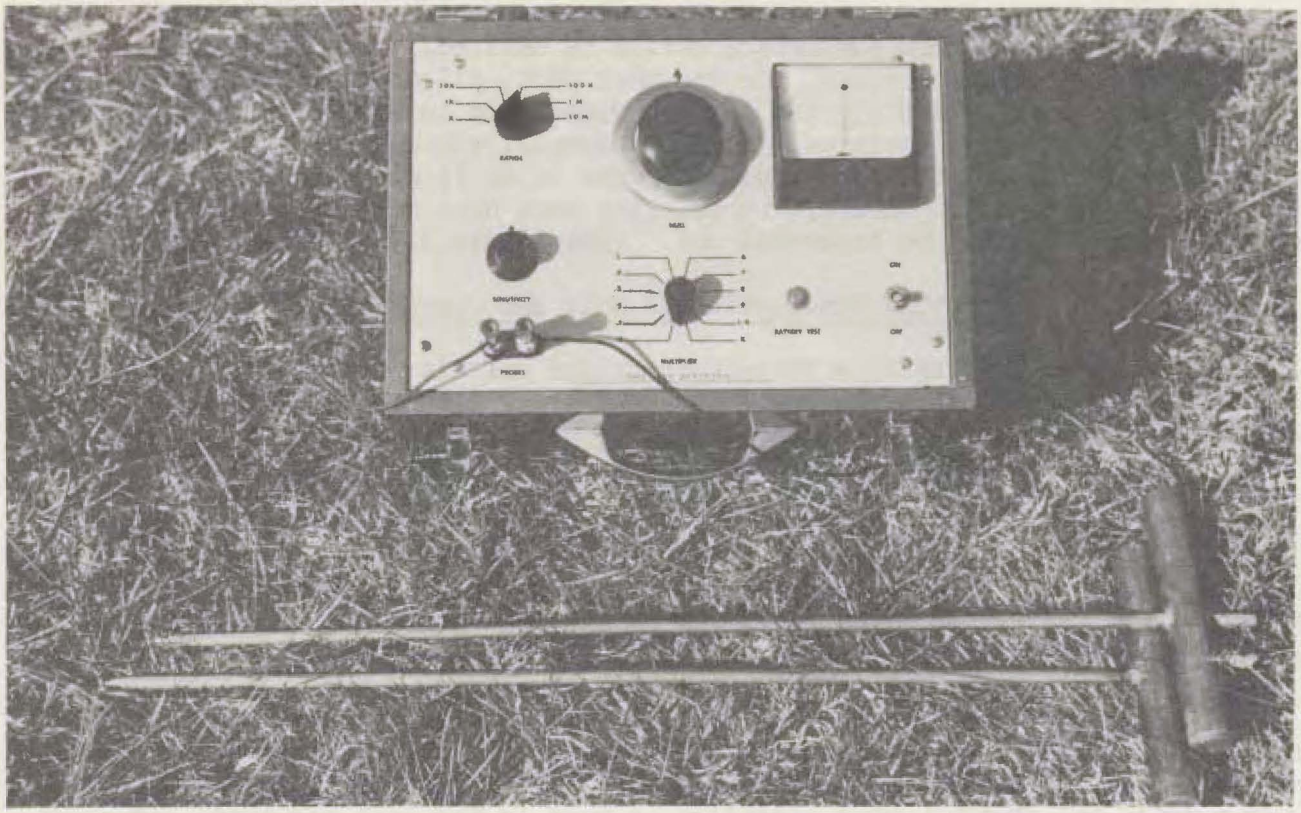


Figure 1. Photograph of the unit with cover detached, probes, and leads, ready for use.

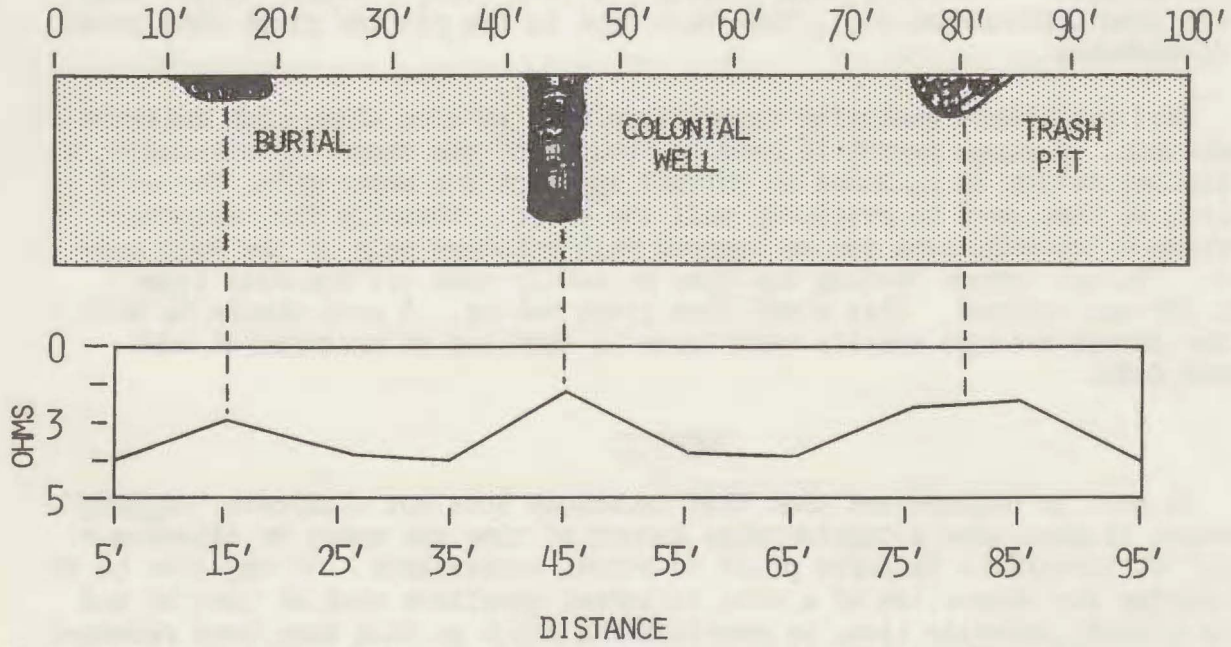


Figure 2. One hundred-foot long profile of a field with probe insertion at ten-foot intervals. The chart below illustrates the relationship of subsurface features with plotted resistance. An example of "low level" use.

are determined by how much subsurface detail is desired. The one-foot interval has been found to reveal, for the most part, all of the features. The readings are taken and plotted in both directions to enable a "picture" or "plan view" of these features. If, for example, you measured through, by chance, a row of post molds you would not know it as it would show up as a decrease in resistance. However, by rotating your next series of readings 90° each post will then be separated out. (See figure 3.)

Technical Description of Unit and Operation

This unit is basically a resistance bridge circuit, with the unknown resistance (the soil) forming one of the four bridge legs. To overcome the effect of probe polarization in the soil, the use of direct current bridge power source was discarded in favor of alternating current. To eliminate the possibility of power line frequences (60 CPS) interfering, a frequency of 1,000 CPS (sine) was selected for the bridge source voltage. While the amplifier does not cutoff at frequencies below this 1,000 CPS figure, the input coupling capacitor has been selected to present a higher impedance at the lower frequencies. The bridge probe current at a soil resistance of, say, 8,000 ohms at a given probe spacing runs around 15 microamperes. (See figure 4.)

The output of the bridge is fed into a very sensitive amplifier, which drives the indicator meter. When the probes are inserted into the ground, the null control is used to null the meter. This setting of the null control is recorded, and another probe insertion is made in the test sequence. If the meter hand moves, the null control is used to bring the needle back toward zero. The new reading is recorded. In this manner an entire series of tests may be plotted. Disturbed soil usually has resistance characteristics that differ from undisturbed soil, therefore dips in the plotted graph show areas of disturbance.

Soil resistance generally varies from area to area along with moisture conditions. A range switch is used to "rough in" the range of resistance; a multiplier switch is included to further approach the meter null; the null control is then used to precisely null the meter. Normally the resistance extremes of a small area can be covered with rotation only of the null control. The resistance reading may then be easily read off the dial from 0 to 100 and plotted. This simplifies graph making. A note should be made of the actual average sterile resistance in ohms and be recorded as additional data.

Summary

It must be pointed out that this technique does not eliminate "digging". However, it does save a considerable amount of time and money by allowing a "look" at subsurface features prior to actual excavations. It may also be of use during the excavation of a site to answer questions such as how far and where a moat, palasade line, or construction ditch go that have been revealed archeologically. The unit was used extensively during the excavations of Fort Prince George and at the excavations of the Lower Cherokee Towns in northwestern South Carolina with unusual success. It seems to be used most success-

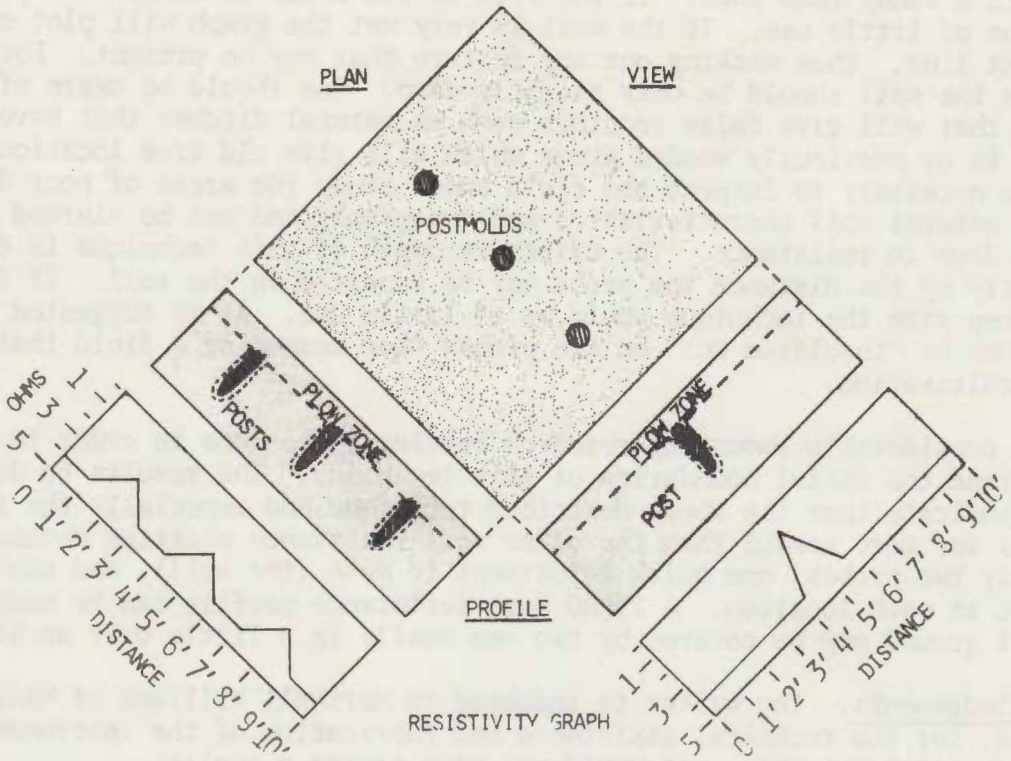


Figure 3. Diagram of a ten-foot unit illustrating the subsurface features and how they appear on the resistance graph. An example of the "high level" use of the instrument.

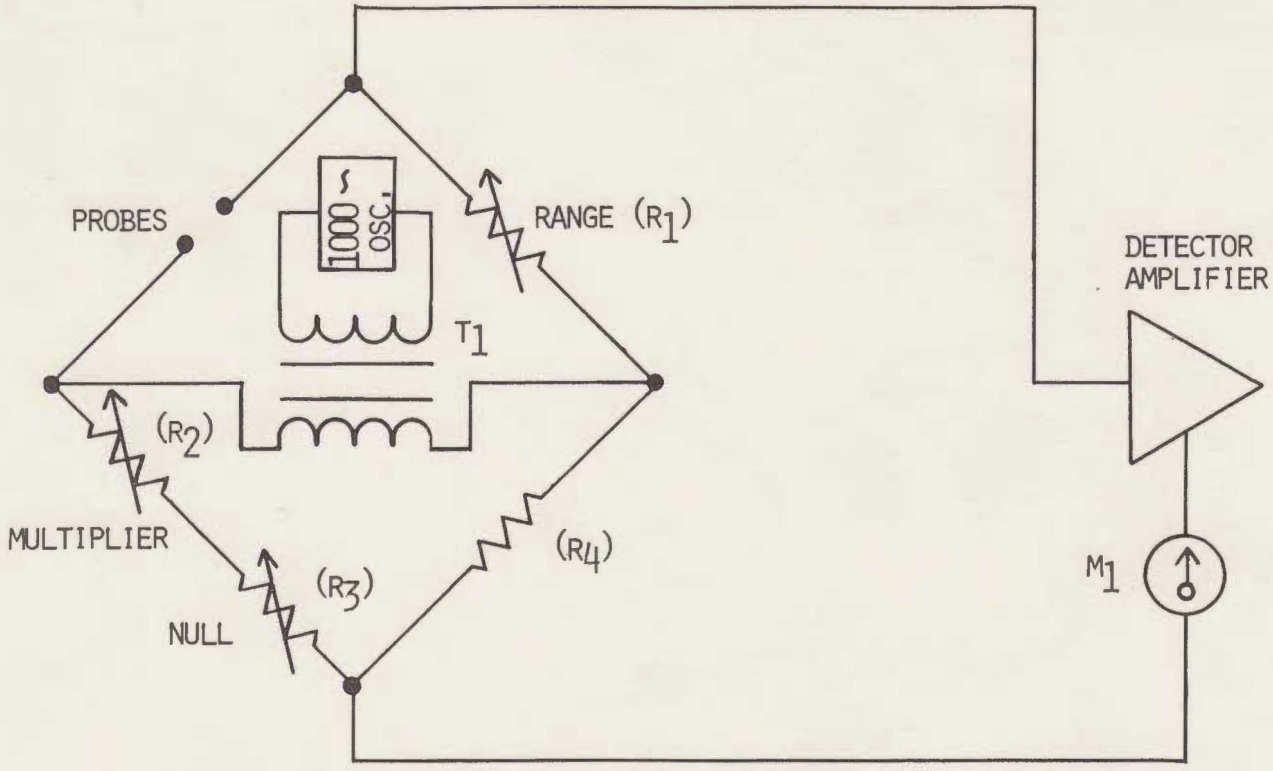


Figure 4. Electrical circuit of the resistance measuring device.

fully in a sandy loam soil. If the soil is too rocky to insert the probes it would be of little use. If the soil is very wet the graph will plot only a straight line, thus masking out any feature that may be present. For optimum results the soil should be only slightly damp. One should be aware of phenomena that will give false readings such as natural ditches that have been silted in or previously wooded areas which will give old tree locations. It is also necessary to inspect the field under study for areas of poor drainage due to natural soil characteristics and topography and not be alarmed by a sudden drop in resistance. The effective depth of this technique is determined primarily by the distance the probe may be inserted in the soil. If it is a very deep site the technique would be of little use. It is suggested that the plow zone be "insulated out" on the probes when measuring a field that has been under cultivation.

A considerable amount of research remains to be done in order to better understand the useful boundaries of this technique. The results to date, however, indicate that the above described technique and especially the instrument is far more useful than the older soil resistance plotting methods. There are only two probes, one quick adjustment to make (the null), and one number to plot at each location. A 2,000 foot resistance profile can be made or an acre of ground may be covered by two men easily in a little over an hour.

Acknowledgements. The writer is indebted to Marshall Williams of Madison, Georgia, for the technical assistance and fabrication of the instrument. Without his assistance this unit would not have become a reality.

Institute of Archeology and Anthropology
The University of South Carolina
Columbia, South Carolina 29208